

REMARKS

In the Office Action mailed on March 26, 2004, the Examiner allowed claims 19-20. Examiner stated that Claims 7, 9-12, and 14 would be allowable if rewritten in independent form including all the limitation of rejected base claim and intervening claims.

Examiner rejected Claims 3-5 and 17 under 35 U.S.C. §112, second paragraph, as indefinite. Claims 1, 2, 6, 8, 13, 15, 16, and 18 rejected under 35 U.S.C. § 103(a) as unpatentable over USPN 6,084,050 to Ooba et al. in view of USPN 6,546,161 to Okuno et al. Applicants appreciate the time and consideration provided by Examiner in reviewing this application, however, respectfully traverse the rejection at least for the following reasons.

Rejection under 35 U.S.C. §112

Claims 3-5 and 17 rejected under 35 U.S.C. §112, second paragraph, have been amended as shown above.

Claim 3 has been amended to more clearly recite the different distances between the annealing regions and the optical waveguide. Applicants believe that this amendment overcomes the Examiner's rejection, however, the rejection is sufficiently unclear, that a telephone call to the undersigned would be appreciated if the Examiner believes that additional clarifying is needed.

As for Claim 4, the amendment is based on Figs. 11B and 12B and their corresponding descriptions (e.g., page 43, lines 9 - 16), as examples of a slit as claimed.

As for Claims 5 and 17, the amendment is based on Figs. 13B and 13C and their corresponding descriptions (e.g., page 43, lines 16 - 24), as examples of a trench as claimed.

Claim 6 has also been amended in order to clarify the subject matter of the invention. The amendment is supported by specification, for example, page 8, lines 15 - 17.

Rejection under 35 U. S. C. §103(a)

According to MPEP §706.02(j):

“To establish a *prima facie* case of obviousness... the prior art reference (or references when combined) must teach or suggest all claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on the applicant’s disclosure.”

Ooba et al. (U.S. Patent 6,084,050) discloses a thin film heater, however do not disclose or suggest how the use of the heater changes the optical path length by the Thermo-Optic effect, as stated by the Examiner.

Okuno et al. (U.S. Patent 6,546,161) discloses that the heat is increased to change the refractive index and therefore changing the optical path length through a thermo-optic phase shifter(also referred to as a thin film heater), as stated by the Examiner.

However, neither Ooba et al. nor Okuno et al. disclose or suggest a *permanent (or irreversible) change* in the refractive index by heating ("annealing" according to the specification) the waveguide and its neighboring region.

It is well known that the thermo-optic effect changes the refractive index only while the heat is applied. In contrast, the present application claims a method of permanently changing the refractive index of an optical waveguide using the effect of "annealing", which means heating the material to the point where a permanent change in refractive index is occurred. This process is described in the specification, for example, on page 8, line 21 to page 9, line 6.

Claims 1, 18, 19 and 20 have been amended to clarify the above definition.

Since Claim 1 as amended is considered to be allowable, claims dependent upon Claim 1 should be allowed as well.

In view of the above, it is respectfully submitted that the application is in condition for allowance which allowance is earnestly solicited.

The Commissioner is hereby authorized to charge any additional fees which may be required in this application under 37 C.F.R. §§1.16-1.17 during its entire pendency,

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or credit any overpayment, to Deposit Account No. 06-1135. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 06-1135.

Respectfully submitted,
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